WE CLAIM:

1. A solid state light emitting device, comprising:

an active layer;

a pair of oppositely doped layers on opposite sides of said active layer which cause said active layer to emit light at a predetermined wavelength in response to an electrical bias across said doped layers; and

a doped substrate, said active and doped layers disposed successively on said substrate such that said substrate absorbs at least some of said light from said active layer and re-emits light at a different wavelength.

2. The light emitting device of claim 1, comprising at least one said active layers and at least a pair of oppositely doped layers, said active layers between two oppositely doped layers which cause said active layers to emit light at a predetermined wavelength is response to a bias across said oppositely doped layers and said substrate absorbs at least some of said light from at least one of said active layers and re-emits light at a different wavelength.

3. The light emitting device of claim 1, further comprising electrical contacts on each said oppositely doped layer to apply said bias across said oppositely doped layers.

4. The light emitting device of claim 1, wherein said active layers are multiple quantum wells, single quantum wells or double heterostructure.

5. The light emitting device of claim 1, wherein said substrate comprises sapphire, spinel, silicon carbide, gallium nitride, quartz YAGI, garnet, lithium gallate, lithium niobate, zinc oxide, or oxide single crystal.

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6. The ~~light~~ emitting device of claim 1, wherein said substrate is doped with at ~~least one~~ rare earth or transition element.

7. The light emitting device of claim 1, wherein said sapphire is doped with at least one impurity such as chromium, titanium, iron, erbium, neodymium, praseodymium, europium, thulium, ytterbium or cerium.

Sub a3

8. The light emitting device of claim 1, comprising a light emitting diode (LED), said active layer emitting UV light and said substrate comprises sapphire doped with chromium, said substrate absorbing some of said UV light and re-emitting red light.

9. The light emitting device of claim 1, comprising a LED, said active layer emitting yellow light and said substrate comprises sapphire doped with chromium, said substrate absorbing some of said yellow light and re-emitting red light.

10. The light emitting device of claim 2, wherein the light emitting from said device comprises the light emitting from at least one of said active layers or the light emitting from at least one of said active layers in combination with the light emitted from said doped substrate.

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11. The light emitting device of claim 2, comprising a LED, said active layers emitting blue, green and UV light and said substrate comprising sapphire doped with chromium which absorbs said UV light and re-emits red light, said LED emits blue, green, UV and red light when all said active layers are emitting, in a white light combination.

12. The light emitting device of claim 11, having three

active layers emitting blue, green and UV light, wherein each said active layer can selectively emit light, said LED emitting primarily red, green, or blue light when one of said active layer is emitting, or said LED emitting primarily purple, aqua, yellow, or white light when more than one said active layer is emitting.

13. The light emitting device of claim 2, comprising a LED, said active layers emitting blue and yellow light, said substrate doped with chromium such that it absorbs at least some of said yellow light and emits red light.

14. The light emitting device of claim 2, comprising a LED, said active layers emitting one color of light, said substrate doped throughout with more than one impurity such that said it absorbs said active layers, light and re-emit more than one color of light.

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15. The light emitting device of claim 2, comprising a LED with at least one said active layer emitting UV light and said substrate doped throughout with chromium, titanium, iron, and cobalt, said doped substrate absorbs said UV light and emits red, green, and blue light.

16. The light emitting device of claim 2, comprising an LED with at least one said active layer emitting UV light, and said substrate doped by one or more rare earth or transition element in separate color centers that absorb UV light and re-emit a different color of light, said bias selectively applied to said active layers above said color centers causing said active layers to emit light that will be primarily absorbed by said color center below said active layers and re-emitted as a different color.

17. The light emitting device of claim 16, further comprising electrical contacts on said oppositely doped

layers to selectively apply said bias to said active layer above said color centers.

18. The light emitting device of claim 17, wherein said active layers emits UV light, and said substrate doped by one or more rare earth or transition element in separate color centers, each said color center absorbs UV light and re-emits it as a different color.

19. The light emitting device of claim 2, comprising a LED wherein said active layers emit blue light and UV light, said substrate absorbs at least some of said UV light and re-emits red light, said LED further comprising downconverting material around the surface of said LED that absorbs some of said blue light emitting from that surface and re-emits yellow light.

20. The light emitting device of claim 1, comprising a solid state laser and further comprising mirrors on opposing surfaces, both said light from said active layer and said light absorbed and re-emitted by said doped substrate reflected between said mirrors to achieve stimulated emission.

21. The light emitting device of claim 20, wherein said active layers emit UV light and said substrate is sapphire doped with cobalt, said laser providing stimulated emission of UV and green light.

22. The light emitting device of claim 20, wherein said active layers emit UV light and said substrate is sapphire doped with chromium, said laser providing stimulated emission of UV and red light.

23. The light emitting device of claim 1, further comprising electrical circuitry integrated with said device

on a common substrate.

24. The light emitting device of claim 1, wherein said doped substrate is doped using solid state diffusion, ion implantation, beam evaporation, sputtering, or laser doping.

25. A method for generating light from a solid state light emitting device, comprising:

exciting an optical emission from an active layer within a first wavelength range;

applying at least a portion of said optical emission to stimulate emission from a doped semiconductor material within a different wavelength range; and

transmitting both emissions.

26. The method of claim 25, wherein said doped semiconductor material comprises sapphire, spinel, silicon carbide, gallium nitride, quartz YAGI, garnet, lithium gallate, lithium niobate, zinc oxide, or oxide single crystal.

27. The method of claim 25, wherein said semiconductor material is doped with at least one rare earth or transition element.

28. The method of claim 25, wherein said semiconductor material is doped with at least one impurity from the group consisting of chromium, titanium, iron, erbium, neodymium, praseodymium, europium, thulium, ytterbium and/or cerium.

29. The method of claim 25, wherein said doped substrate is doped using solid state diffusion, ion implantation, beam evaporation, sputtering, or laser doping.

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Sub A6

Sub C7

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